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Determination of a slightly corrected Value of the Solar Parallax from the data of Le Verrier's Solar Tables. By E. J. Stone, Esq.

In Tome iv. of the *Annales de l'Observatoire Impérial de Paris, Recherches Astronomiques*, page 101, will be found a determination of the Sun's mean horizontal equatoreal Solar Parallax by M. Le Verrier. The method adopted is to determine from observation the coefficient of the parallactic inequality in the Earth's motion, and thence by a comparison of the theoretical expression with the observed value to deduce the Sun's Parallax. The value of the coefficient thus found by M. Le Verrier is 6″·50. The Solar Parallax π is then found from the equation

$$\pi = 0{\cdot}01662 + 6{\cdot}50 \left\{ 1 + \frac{1}{\mu} \right\},$$

where μ is the ratio of the Moon's mass to that of the Earth.

To determine μ M. Le Verrier adopts the constant of nutation = 9″·23, and the constant of (Lunar Solar) precession = 50″·3714. He then obtains the following equation,—

$$\mu = \frac{2{\cdot}1866}{(3422)^3} \frac{\pi^3}{m'},$$

where m'' is the ratio of the mass of the Earth to that of the Sun.

M. Le Verrier adopts for

$$\log \frac{\pi^3}{m''} \text{ the value } 8{\cdot}35199,$$

and thence deduces $\mu = \frac{1}{81{\cdot}84}$. This gives $\pi = 8''{\cdot}95$ and $m'' = \frac{1}{314000}$. There is, however, a slight mistake in the numerical work, which alters the value of μ, and consequently also those of π and m''. I find, adopting the same data

$$\mu = \frac{1}{81{\cdot}48}, \quad \pi = 8{\cdot}91, \quad m'' = \frac{1}{317590}$$

That so slight a change in the Moon's mass should alter the resulting value of the parallax 0″·04 shows the weak point in this method of determining the Solar Parallax. If we adopted a value of the Moon's mass equal to $\frac{1}{78{\cdot}4}$ of that of the Earth, we should deduce Encke's value 8″·58 of the Solar Parallax. The coefficient of the parallactic inequality is undoubtedly very accurately determined, and is entirely free from any suspicion of systematic error arising from an erroneous assumption of telescopic semi-diameter; a suspicion which must weaken our

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confidence in the value (of Solar Parallax) deduced from the corresponding inequality in the Lunar Theory. The agreement of the value, thus deduced, with those lately obtained by other methods proves the consistence of our adopted values of the constant of Solar Parallax, Nutation and Precession.

Solar Eclipse of March 5, 1867. Observed at the Royal Observatory, Edinburgh. By C. Piazzi Smyth, Astronomer Royal for Scotland.

The Solar Eclipse of March 5th (Astronomical) had its commencement—as seen from here—quite concealed by thick clouds; the middle, partly clear; and the end, entirely so.

The end of the eclipse was observed with the Playfair Alt-Azimuth instrument at $22^{h}\ 38^{m}\ 38^{s}{\cdot}7$ Edinburgh Mean Time; Mr. Fox Talbot being the observer at the telescope, and the time being noted for him by myself.

Several small photographs of the later phases of the eclipse were taken by Mr. W. H. Davies, member of the Edinburgh Photographic Society,—at 89 George Street in this city; I have the honour to inclose one of the most interesting which he has kindly sent me.

In a letter just received from M. Otto Struve, he states that the eclipse was well observed at Poulkova; but that a party whom he had sent on the line of the annular features in the government of Nijni Novgorod, had been entirely defeated by bad weather.

Eclipse of the Sun, 1867, *March* 5, *and Occultation of a Star by the Moon*, 1867, *Jan.* 16; *observed at the Royal Observatory, Greenwich.*

(*Communicated by the Astronomer Royal.*)

Eclipse of the Sun.

The time of the beginning of the eclipse was observed as follows: clouds prevented further observation.

Mean Solar Time of beginning of Eclipse.				Instrument.	Observer.
d	h	m	s		
March 5	20	17	35·12 (*a*)	North Equatoreal	E.
„	20	17	28·52	46-inch detached	C.
„	20	17	34·02	36-inch detached	L.
„	20	17	31·29 (*b*)	Great Equatoreal	J. C.

(*a*) Clouds passing; the Sun's limit continually obscured: at the time noted the Moon's limb was first seen, and the eclipse had probably begun not many seconds.

(*b*) Uncertain to a second: probably too late by that quantity.

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